

### **REMARKS**

Claims 1-49 are pending in the application; Claims 15-49 are subject to a Restriction Requirement. With this response, Applicant has amended Claims 1-3 and cancelled Claims 15-49. Upon entry of the amendments, Claims 1-14 remain pending.

Support for the amended claims is found in the specification as originally filed.

Applicant has amended paragraph 0082 of the specification to give the correct spelling of a tradename, and to correct the chemical name of Luperco 101. No new matter is added, as both corrections are to errors that would be readily apparent to one of ordinary skill in the art.

Applicant respectfully requests entry of the amendments.

### **RESTRICTION REQUIREMENT**

In response to the Restriction Requirement, Applicant has cancelled Claims 15-49 as drawn to a non-elected invention.

### **DOUBLE PATENTING REJECTION**

Claims 1-14 are provisionally rejected for obviousness-type double patenting over Claims 1-58 of co-pending Application No. 10/813,527. Applicant respectfully traverses the rejection as applied to the amended claims and requests reconsideration. For illustration, amended Claim 1 of the current application and Claim 1 of the co-pending application are presented in the following table.

U.S. Application 10/771,693 Current Application (Atty Docket: 03-0050; 8470-000014)	U.S. Application 10/813,527 Co-pending Application (Atty Docket: 03-0055; 8470-000026)
<p>1. (currently amended) A method of preparing a moldable polymer composition comprising:</p> <p>(a) forming a mixture of a <u>fluoroplastic thermoplastic material</u> and a curable fluorocarbon elastomer at a temperature above the melting point of the thermoplastic;</p> <p>(b) adding a curing composition to the mixture, wherein the curing composition comprises an initiator having a half-life of 0.1 hours or more at a temperature of about <del>180°C</del> <u>190°C</u> or higher and crosslinking agent; and</p> <p>(c) heating while continuing to mix the mixture and the curing composition <u>at a temperature and for a time sufficient to cure the elastomer.</u></p>	<p>1. A processable rubber composition comprising a cured fluorocarbon elastomer dispersed in a matrix comprising a thermoplastic material, wherein:</p> <p>the thermoplastic material comprises a fully fluorinated melt-processable thermoplastic polymer and a partially fluorinated melt-processable thermoplastic polymer; and</p> <p>the cured fluorocarbon elastomer is present at a level of greater than or equal to 35% by weight based on the total weight of cured fluorocarbon elastomer and thermoplastic material.</p>

The current claims (illustrated in the left-hand column) are drawn to methods of preparing moldable polymer compositions wherein a key limitation is that a curing initiator has a half-life of 0.1 hours or more at a temperature of about 190°C or higher. The co-pending claims, on the other hand, are drawn to compositions and methods wherein cured elastomer is present at a level of greater than 35% by weight of the total weight of elastomer and thermoplastic, and wherein the thermoplastic itself is a mixture of a fully fluorinated thermoplastic and a partially fluorinated thermoplastic. There is no suggestion in the current claims to use a mixture of thermoplastic material as recited in the co-pending claims. Likewise, there is no suggestion in the co-pending claims to use specifically initiators having the indicated half-life.

In light of the above comparison of the claims, Applicant respectfully submits that the subject matter of the current claims and the co-pending claims are not obvious in light of each other. Accordingly, Applicant respectfully requests that the double-patenting rejection be withdrawn.

#### **REJECTIONS UNDER 35 U.S.C. § 102**

Claims 1-4 and 11-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by the *Kamiya* reference (U.S. Pat. No. 5,354,811). Applicant respectfully traverses the rejection as applied to the amended claims and requests reconsideration.

As stated by the Examiner, *Kamiya* discloses the use of "Perbutyl P™" in the comparative examples of Table 1. The Office Action states that Perbutyl P is  $\alpha,\alpha'$ -bis(tert-butylperoxy-isopropyl)benzene. The Office Action states that such a peroxide is taught as suitable at paragraph 67 of the specification and that such an initiator would be expected to have the claimed half-life limitation.

Applicant respectfully points out that the Perbutyl P™ curing agent of *Kamiya*, in fact, has a half-life temperature of only 169°C. This is seen, for example, in the attached data sheet of AKZO NOBEL, showing the subject peroxide in the fifth column under the name of Percodox® 14S-FL and others. As shown in the supplier's table, the peroxide has a half-life temperature of 169°C.

Thus, *Kamiya* teaches using low temperature peroxides while the amended claims recite using peroxide initiators having a half-life of 0.1 hours at temperatures of 190°C or higher. Because *Kamiya* does not contain all of the limitations of the amended claims, Applicant respectfully requests the rejection be withdrawn.

Applicant further submits that the claims are non-obvious in view of *Kamiya*. The half-life temperature of the curing agent disclosed in *Kamiya* is 21°C below the claimed limitation. There is no motivation in *Kamiya* or in the knowledge of the person of skill in the art to modify the reference by making this large a change in curing agent.

Claims 1-3 and 10 are rejected under U.S.C. § 102(b) as being anticipated by the *Sakai* reference (U.S. Pat. No. 5,206,293). Applicant respectfully traverses the rejection as applied to the amended claims and requests reconsideration.

Applicant has amended Claim 1 to recite that the thermoplastic material is a fluoroplastic. In *Sakai*, on the other hand, the thermoplastic material is selected from polyethylene, ethylene vinyl acetate, and the like. (See Abstract.) The fluoroplastic thermoplastic material of the amended claims is not disclosed or suggested by the reference. Accordingly, Applicant respectfully requests the rejection, as applied to the amended claims, be withdrawn.

Applicant also submits that the claims are not obvious from *Sakai*. *Sakai* provides no suggestion for using a fluoroplastic as thermoplastic material.

Claims 1-4, 6, 10, and 12-14 are rejected under U.S.C. § 102(b) as being anticipated by the *Chen* reference (U.S. Pat. No. 6,310,141). Applicant respectfully traverses the rejection and requests reconsideration.

*Chen* does not disclose dynamic vulcanization as recited in the amended claims. In this light, Applicant has amended Claim 1 to recite in paragraph c) that heating is carried out at a temperature and at a time sufficient to cure the elastomer. In *Chen*, the curing process involves extruding a blend into a desired shape and autoclaving at temperatures between 125°C and 180°C; alternatively by compression molding the

compounded blend typically at temperatures at about 95°C and 230°C. See generally, column 6, lines 27-61.

*Chen* discloses a second method of producing the compositions by forming a core shell polymer by, for example, changing the monomer feed at a desired point during polymerization. See column 6, lines 62 to column 7, line 7. *Chen* does not disclose dynamic vulcanization as recited in the amended claims.

Because the reference fails to disclose at least one of the limitations of the amended claims, Applicant respectfully requests that the rejection be withdrawn.

Applicant further submits that the claims are non-obvious from *Chen*. The teaching of static vulcanization, in particular, does not suggest Applicant's dynamic vulcanization.

Claims 1-5, 10, and 12-14 are rejected under U.S.C. § 102(b) as being anticipated by the *Pazos* reference (EP 0168020). Applicant respectfully requests reconsideration in view of the amended claims.

Applicant has amended Claim 1 to recite that the initiator has a half-life of 0.1 hours or more at a temperature of about 190°C or higher. The reference on the other hand, (as stated in the Office Action) discloses 2,5-dimethyl-2,5-di(tertbutylperoxy)hexyne-3.

The peroxide initiator of *Pazos* has a half-life temperature of only 182°C, as shown for example in the attached data sheet of AKZO NOBEL in the first row under the name Trigonox® 145-E85. *Pazos* does not disclose or suggest the use of peroxide initiators having half-life temperatures of above 190°C, above 200°C, or above 207°C as recited in the amended claims. The claims are therefore novel.

Applicant respectfully submits that the claims are non-obvious. There is no motivation, outside the current teachings, to modify *Pazos* to arrive at the claimed subject matter drawn to half-life temperatures of 190°C, 200°C, and 207°C, as required by Claims 1, 2 and 3, respectively. Accordingly, Applicant respectfully requests the rejection be withdrawn.

**REJECTION UNDER 35 U.S.C. § 103**

Claims 1-14 are rejected under 35 U.S.C. § 103(a) as obvious over the *Kamiya* reference (U.S. Pat. No. 5,354,811). Applicant respectfully traverses the rejection as applied to the amended claims and requests reconsideration.

The deficiencies of the *Kamiya* reference as applied to the amended claims are discussed above. Applicant respectfully submits that *Kamiya* does not suggest the limitations in the amended claims. Accordingly, Applicant respectfully requests the rejection be withdrawn.

Claims 1-3 and 5-14 are rejected under 35 U.S.C. § 103(a) as obvious over the *Sakai* reference (U.S. Pat. No. 5,206,293). Applicant respectfully traverses the rejection and requests reconsideration.

As noted above, Applicant amends the claims to recite that the thermoplastic material is a fluoroplastic. As developed above, *Sakai* does not teach or suggest this limitation of the amended claims. Accordingly, Applicant respectfully requests the obviousness rejection in view of the reference be withdrawn.

Claims 1-7, 10, and 12-14 are rejected under 35 U.S.C. § 103(a) as obvious over the *Chen* reference (U.S. Pat. No. 6,310,141). Applicant respectfully traverses the rejection and requests reconsideration.

The deficiencies of *Chen* are discussed above. In particular, the reference does not disclose dynamic vulcanization as recited in the amended claims. Accordingly, Applicant respectfully requests the rejection be withdrawn.

Claims 1-3, 5, 6, and 10 are rejected under 35 U.S.C. § 103(a) in light of the *Matsumoto* reference (U.S. Pat. No. 5,962,589). Applicant respectfully traverses the rejection as applied to the amended claims and requests reconsideration.

As noted above, Applicant has amended Claim 1 to clarify that the method of preparing the moldable polymer composition is a dynamic vulcanization method. Step c) has been amended to clarify that heating is continued while mixing at a temperature and for a time sufficient to cure the elastomer. Such a dynamic vulcanization procedure is not disclosed or suggested in the *Matsumoto* reference.

*Matsumoto* differs from the amended claims in at least two aspects, neither of which are suggested by the reference. First, *Matsumoto* fails to disclose a mixture of a thermoplastic material and a curable elastomer. At column 2, line 25, *Matsumoto* states:

“The present invention provides a rubber composition... comprising 100 parts by weight of a mixture..., the mixture comprising 5 to 55 wt. % of a... fluororubber... and 95 to 45 wt. % of an acrylic rubber....”

*Matsumoto* discloses blends of a fluororubber and an acrylic rubber, and does not call for a fluoroplastic as recited in the amended claims.

Next, *Matsumoto* fails to disclose a dynamic vulcanization method of preparing moldable polymer compositions as recited in the amended claims. Methods for curing the compositions to provide useful articles are described for example at column 8, line 60 of the reference:

“Compositions for crosslinking were prepared each by kneading a fluororubber, acrylic rubber, and other components... by an open roll mill. Each composition was vulcanized on a press at 160°C for 20 minutes and further vulcanized in an oven at 180°C for 4 hours.”

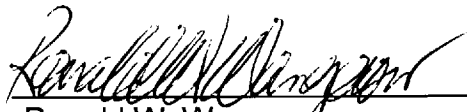
Vulcanization in the reference is static, not dynamic. For these reasons, Applicant respectfully submits the claims are patentable over *Matsumoto*, and respectfully requests the rejections be withdrawn.

#### **CONCLUSION**

For the reasons discussed above, Applicant believes Claims 1-14 are in an allowable state and respectfully requests an early Notice of Allowance. The Examiner is invited to telephone the undersigned if that would be helpful to resolving any issues.

Respectfully submitted,

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# Cross Linking Organic Peroxides Half-Life Data

Product	Chemical Name	Peroxide Content (%)	Temperature (°C) at which T <sub>1/2</sub> =		
			0.1 h	1 h	10 h
Trigonox® 145-E85	2,5-Dimethyl-2,5-di (tert-butylperoxy)hexyne-3	85	182	157	127
Trigonox 145-45B-pd		45			
Trigonox B	Di-tert-butyl peroxide	99	176	154	120
Trigonox 101	2,5-Dimethyl-2,5-di (tert-butylperoxy)hexane	94	171	147	118
Trigonox 101-45B-pd		45			
Trigonox 101-45S-ps		45			
Trigonox T	Tert-butyl cumyl peroxide	95	169	146	117
Perkadox® 14S-FL	Di(2-tert-butylperoxy- isopropyl)benzene	96	169	146	117
Perkadox 14-40B-pd		40			
Perkadox 14-40K-pd		40			
Perkadox 14-40A-gr		40			
Perkadox 14-40B-gr dd		40			
Perkadox BC	Dicumyl peroxide	98	162	138	112
Perkadox BC-40B-pd		40			
Perkadox BC-40K-pd		40			
Perkadox BC-40S-ps		40			
Perkadox BC-40P-pd		40			
Perkadox BC-40B-gr dd		40			
Trigonox 17-40B-pd	Butyl 4,4-di-(tert-butyl peroxy)valerate	40	152	130	104
Trigonox 17-40MB-gr		40			
Trigonox 29-40B-pd	1,1-Di-(tert-butylperoxy)- 3,5,5-trimethylcyclohexane	40	138	117	91
Trigonox 29-40MB-gr		40			
Trigonox C	Tert-butyl peroxybenzoate	98	136	110	87
Trigonox C-40B-pd		40			
Trigonox 42-40B-pd	t-butyl peroxy-3,5,5- trimethylhexanoate	40	135	114	95
Perkadox PM-50S-ps	Di(4-methylbenzoyl) Peroxide	50	98	77	56
Perkadox S-50S-ps	Dibenzoyl peroxide	50	95	74	55
Perkadox PD-50S-ps	Di(2,4-dichlorobenzoyl) peroxide	50	80	65	47
Perkadox TML		50			



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